

SAIP2013



Contribution ID : 171

Chromatic dispersion compensation for VCSEL transmission for applications such as Square Kilometre Array South Africa

Wednesday 10 Jul 2013 at 14:10 (00h20')

Abstract :

In addition to attenuation, optical fibre transmission suffers significant penalty from dispersion related effects. We theoretically and experimentally investigate the compensation of chromatic dispersion of 4.25 Gbps 1550 nm vertical cavity surface emitting laser (VCSEL) transmission using inverse dispersion fibre. Simulated results show that inverse dispersion fibre can compensate up to 3.7 dB on a 35 km ITU-T G.652 fibre. The residual dispersion penalties are small, thus effective compensation is achieved. In an experimental demonstration, a 25 km low water peak (LWP) fibre with a low negative dispersion value was found to improve the signal clarity when combined with a G.652 fibre. Inverse dispersion fibres cancel the cumulated dispersion in transmitting fibres, hence improving the VCSEL transmission significantly. This is a cost effective and simple chromatic dispersion mitigation technique, suitable for Square Kilometre Array application as the transmission distances increase at different construction phases. Key words: VCSEL, Chromatic dispersion, compensation, Square Kilometre Array

Award :

Yes

Level :

PhD

Supervisor :

Prof. Tim Gibbon. Tim.Gibbon@nmmu.ac.za Nelson Mandela Metropolitan University

Paper :

Yes

Primary authors : Mr. ROTICH KIPNOO, Enoch (Nelson Mandela Metropolitan University)

Co-authors : Mr. KOUROUMA, Hamed (Nelson Mandela Metropolitan University) ; Dr. GAMATHAM, Romeo (Nelson Mandela Metropolitan University) ; Prof. LEITCH, Andrew (Nelson Mandela Metropolitan University) ; Prof. GIBBON, Tim (Nelson Mandela Metropolitan University)

Presenter : Mr. ROTICH KIPNOO, Enoch (Nelson Mandela Metropolitan University)

Session classification : Applied

Track classification : Track F - Applied Physics

Type : Oral Presentation